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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,841	04/15/2004	Arjang Fartash	200312702-1	9435

22879 7590 02/28/2007  
HEWLETT PACKARD COMPANY  
P O BOX 272400, 3404 E. HARMONY ROAD  
INTELLECTUAL PROPERTY ADMINISTRATION  
FORT COLLINS, CO 80527-2400

EXAMINER
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LAVILLA, MICHAEL E

ART UNIT	PAPER NUMBER
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1775

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/28/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above; the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/825,841

Applicant(s)

FARTASH, ARJANG

Examiner

Michael La Villa

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-53 and 57-61 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 49 is/are allowed.
- 6) ☒ Claim(s) 1,3-10,12,15-17,19,29,31,32,34,37,44, 50, and 57-61 is/are rejected.
- 7) ☒ Claim(s) 2,11,13,14,18,20-28,30,33,35,36,38-43,45-48 and 51-53 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                                            |                                                                                         |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                           | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

## **DETAILED ACTION**

### ***Specification***

1. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o).

Correction of the following is required: It is unclear where the Specification includes the terminology of the various claim limitations of Claims 57-61. While applicant's pointing out support for the invention may clarify this issue, in the event that support is provided for and the terminology is not utilized, the Specification should be amended to provide the terminology.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:
3. The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
4. Claims 57-61 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicant has presented these new claims without providing an explanation of how the originally filed Specification provides antecedent support for them. It is therefore unclear what is the basis for antecedent support. While paragraph 21 of the Specification arguably supports aspects of Claim 57, it is unclear whether

the entirety of the breadth of Claim 57 is supported thereby and it is unclear how the other claims are supported.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:
6. The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
7. Claims 57-61 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
8. Regarding Claim 57, it is unclear what is the full breadth of meaning of the phrase "means for generating a difference in thermal conductivity laterally" that is contemplated. Is the only "means" that described at paragraph 21 of the Specification?
9. Regarding Claim 59, it is unclear what is the antecedent basis of the phrase "said means for heating" as there is no mention of heating in Claim 57.
10. Regarding Claim 60, it is unclear what is the full breadth of meaning of the phrase "means for generating a difference in electrical conductivity laterally" that is contemplated. Is the only "means" that described at paragraph 21 of the Specification? It is unclear whether the use of the word "further" necessarily means that the contemplated means is something other than whatever means are used to generate the difference in thermal conductivity of Claim 57.
11. Regarding Claim 61, it is unclear how the tantalum layer can have a uniform composition when paragraph 21 describes the means for generating difference in thermal conductivity as stemming from patterned alpha and beta Ta in the layer.

***Claim Rejections - 35 USC § 102***

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

13. A person shall be entitled to a patent unless –

14. (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

15. Claims 1, 3-10, 12, 15-17, 19, 29, 31, 32, 34, 37, 44, and 50, 57, 60, and 61 are

rejected under 35 U.S.C. 102(e) as being anticipated by Seet et al. USPA

2004/0131878 for the reasons of record in the Office Action mailed on 26 July

2006. With respect to Claims 57, 60, and 61, Seet et al. teaches that the

tantalum layer is substantially uniform in thickness and composition, comprising

regions of both alpha and beta Ta. Seet et al. also teaches that the tantalum

layer is comprised of alpha and beta Ta, which applicant has explained gives rise

to differences in thermal conductivity and electrical conductivity. Therefore, on

the dimension scale of these different phases, as one moves laterally across the

layer, it would be expected that the claimed variation in thermal and electrical

conductivity would be observable.

***Response to Amendment***

16. In view of applicant's amendments, applicant traverses the section 102 rejection

over Seet et al. of the Office Action mailed on 26 July 2006. With respect to

Claim 1, Seet teaches mixed phase Ta layer, wherein the first layer is the copper

underlayer and the second layer is the copper overlayer. With respect to Claim 50, Seet teaches in Figure 2C the presence of a copper seed layer in making layer 34 and teaches a barrier layer 16 that is interposed between 14 and 24 of the mixed phase Ta layer. With respect to Claims 3 and 4, contacted and contiguous regions are respective regions localized on opposite sides in the thickness direction. With respect to Claims 5 and 16, the second copper layer is over the substrate of layer 10, over the copper layer 13, and over the Ta layer 24. With respect to Claim 12, layer 10 in Figure 2C may be sacrificed. Rejection of Claims 27 and 28 is withdrawn. Otherwise, rejections are maintained as set forth above.

***Allowable Subject Matter***

17. Claims 2, 11, 13, 14, 18, 20-28, 30, 33, 35, 36, 38-43, 45-48, and 51-53 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
18. Claim 49 is allowed.

***Conclusion***


19. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

20. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.
21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael La Villa whose telephone number is (571) 272-1539. The examiner can normally be reached on Monday through Friday.
22. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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23. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Michael La Villa  
19 February 2007

  
MICHAEL E. LAVILLA PH.D.  
PRIMARY EXAMINER